Claims

[1] A needle pointer type meter, comprising:

an index plate having a first through-vision section and indexes surrounding the first through-vision section;

a movable body having a second through-vision section;

a drive device for moving the movable body;

a needle pointer which is attached to the movable body and moves along the indexes around the first through-vision section;

a light source for illuminating the needle pointer; and

a display device for displaying predetermined information to an observer through the first and second through-vision sections, characterized in that:

the light source is formed by a plurality of light sources disposed at certain intervals along the movement route of the needle pointer, and the needle pointer is made of light-transmissive material which receives light from a given light source of the plural light sources in accordance with the movement of the needle pointer so that the needle pointer can emit light;

the light source is formed by a belt-shaped planar light-emitting body disposed along the movement route of the needle pointer, and the needle pointer is made of light-transmissive material which receives light from a particular light-emitting region of the light source in

accordance with the movement of the needle pointer so that the needle pointer can emit light;

the light source is formed by a pipe-shaped light-emitting body disposed along the movement route of the needle pointer, and the needle pointer is made of light-transmissive material which receives light from a particular light-emitting region of the light source in accordance with the movement of the needle pointer so that the needle pointer can emit light; or

illumination means is formed by a light transmissive body disposed along the movement route of the needle pointer and a light source for supplying light such that the light transmissive body can emit light, and the needle pointer is made of light-transmissive material which receives light from a particular light-emitting region of the light transmissive body in accordance with the movement of the needle pointer so that the needle pointer can emit light.

[2] A needle pointer type meter, comprising:

an index plate having a first through-vision section and indexes surrounding the first through-vision section;

a movable body which has a second through-vision section corresponding to the first through-vision section;

a drive device for moving the movable body;

a needle pointer which is attached to the movable body and moves along the indexes around the first through-vision

section;

a light source for illuminating the needle pointer; and

a display device for displaying predetermined information to an observer through the first and second through-vision sections, characterized in that:

the light source is formed by a plurality of light sources disposed at certain intervals along the movement route of the needle pointer, and the needle pointer is made of light-transmissive material which receives light from a given light source of the plural light sources in accordance with the movement of the needle pointer so that the needle pointer can emit light.

[3] A needle pointer type meter, comprising:

an index plate having a first through-vision section and indexes surrounding the first through-vision section;

a movable body which has a second through-vision section corresponding to the first through-vision section;

a drive device for moving the movable body;

a needle pointer which is attached to the movable body and moves along the indexes around the first through-vision section;

a light source for illuminating the needle pointer; and

a display device for displaying predetermined information to an observer through the first and second through-vision sections, characterized in that:

the light source is formed by a belt-shaped planar light-emitting body disposed along the movement route of the needle pointer, and the needle pointer is made of light-transmissive material which receives light from a particular light-emitting region of the light source in accordance with the movement of the needle pointer so that the needle pointer can emit light.

[4] A needle pointer type meter, comprising:

an index plate having a first through-vision section and indexes surrounding the first through-vision section;

a movable body which has a second through-vision section corresponding to the first through-vision section;

a drive device for moving the movable body;

a needle pointer which is attached to the movable body and moves along the indexes around the first through-vision section;

a light source for illuminating the needle pointer; and

a display device for displaying predetermined information to an observer through the first and second through-vision sections, characterized in that:

the light source is formed by a pipe-shaped light-emitting body disposed along the movement route of the needle pointer, and the needle pointer is made of light-transmissive material which receives light from a particular light-emitting region of the light source in

accordance with the movement of the needle pointer so that the needle pointer can emit light.

[5] A needle pointer type meter, comprising:

an index plate having a first through-vision section and indexes surrounding the first through-vision section;

a movable body which has a second through-vision section corresponding to the first through-vision section;

a drive device for moving the movable body;

a needle pointer which is attached to the movable body and moves along the indexes around the first through-vision section;

illumination means for illuminating the needle pointer; and

a display device for displaying predetermined information to an observer through the first and second through-vision sections, characterized in that:

the illumination means is formed by a light transmissive body disposed along the movement route of the needle pointer and a light source for supplying light such that the light transmissive body can emit light, and the needle pointer is made of light-transmissive material which receives light from a particular light-emitting region of the light transmissive body in accordance with the movement of the needle pointer so that the needle pointer can emit light.

[6] A needle pointer meter as set forth in claim 1,

characterized in that:

the first through-vision section is formed by a penetrating portion;

the plural light sources are disposed on the outer periphery of the indexes and at inner positions from the surface of the index plate such that respective light-emitting portions of the light sources face to the first through-vision section; and

the needle pointer has a light introduction portion which extends between the light sources and the first through-vision section along the back surface of the index plate to introduce light emitted from the light sources toward the first through-vision section, an indicator which extends between the first through-vision section and the light sources along the front surface of the index plate to indicate the indexes, and an intermediate portion which connects the indicator and the light introduction portion on the first through-vision section side and introduces light coming from the light introduction portion to the indicator so that the indicator can emit light.

[7] A needle pointer type meter as set forth in claim 3, characterized in that:

the first through-vision section is formed by a penetrating portion;

the light source is disposed on the outer periphery of the indexes and at an inner position from the surface of the

index plate such that the light-emitting region of the light source faces to the first through-vision section; and

the needle pointer has a light introduction portion which extends between the light source and the first through-vision section along the back surface of the index plate to introduce light emitted from the light source toward the first through-vision section, an indicator which extends between the first through-vision section and the light source along the front surface of the index plate to indicate the indexes, and an intermediate portion which connects the indicator and the light introduction portion on the first through-vision section side and introduces light coming from the light introduction portion to the indicator so that the indicator can emit light.

[8] A needle pointer type meter as set forth in claim 5, characterized in that:

the first through-vision section is formed by a penetrating portion;

the light transmissive body is disposed on the outer periphery of the indexes and at an inner position from the surface of the index plate such that a light supplying portion for supplying light to the needle pointer faces to the first through-vision section; and

the needle pointer has a light introduction portion which extends between the light transmissive body and the first through-vision section along the back surface of the index

plate to introduce light emitted from the light supplying portion of the light transmissive body toward the first through-vision section, an indicator which extends between the first through-vision section and the light transmissive body along the front surface of the index plate to indicate the indexes, and an intermediate portion which connects the indicator and the light introduction portion on the first through-vision section side and introduces light coming from the light introduction portion to the indicator so that the indicator can emit light.

[9] A needle pointer type meter as set forth in claim 6, characterized in that the light introduction portion extends from the intermediate portion forming a sector.

[10] A needle pointer type meter as set forth in claim 6, characterized in that:

a light introduction plate is disposed between the light introduction portion and the index plate or the indexes;

the light-emitting portion of the light source is opposed to both the outer peripheral sides of the light introduction plate and the light introduction portion; and

light emitted from the light source is introduced through the respective outer peripheral sides into the light introduction plate and the light introduction portion so that the indicator and the indexes can emit light.

[11] A needle pointer type meter as set forth in claim 7,

characterized in that:

a light introduction plate is disposed between the light introduction portion and the index plate or the indexes;

the light-emitting region of the light source is opposed to both the outer peripheral sides of the light introduction plate and the light introduction portion; and

light emitted from the light source is introduced through the respective outer peripheral sides into the light introduction plate and the light introduction portion so that the indicator and the indexes can emit light.

[12] A needle pointer type meter as set forth in claim 8, characterized in that:

a light introduction plate is disposed between the light introduction portion and the index plate or the indexes;

the light supplying portion of the light transmissive body is opposed to both the outer peripheral sides of the light introduction plate and the light introduction portion; and

light coming from the light transmissive body is introduced through the respective outer peripheral sides into the light introduction plate and the light introduction portion so that the indicator and the indexes can emit light.

[13] A needle pointer type meter as set forth in claim 6, characterized in that:

a light introduction plate is disposed between the light introduction portion and the index plate or the indexes;

the light source is opposed to the outer peripheral side of the light introduction portion, and light emitted from the light source is introduced through the outer peripheral side of the light introduction portion so that the indicator can emit light;

a plurality of index light sources which are disposed at certain intervals in such positions that respective light emitting portions of the index light sources face to the first through-vision section are opposed to the outer peripheral side of the light introduction plate; and

light emitted from the index light sources is introduced through the outer peripheral side of the light introduction plate so that the indexes can emit light.

[14] A needle pointer type meter as set forth in claim 7, characterized in that:

a light introduction plate is disposed between the light introduction portion and the index plate or the indexes;

the light source is opposed to the outer peripheral side of the light introduction portion, and light emitted from the light source is introduced through the outer peripheral side of the light introduction portion so that the indicator can emit light;

an index light source formed by a belt-shaped planar light-emitting body disposed in such a position that a light-emitting region of the index light source faces to the

first through-vision section is opposed to the outer peripheral side of the light introduction plate; and

light emitted from the index light source is introduced through the outer peripheral side of the light introduction plate so that the indexes can emit light.

[15] A needle pointer type meter as set forth in claim 7, characterized in that:

a light introduction plate is disposed between the light introduction portion and the index plate or the indexes;

the light source is opposed to the outer peripheral side of the light introduction portion, and light emitted from the light source is introduced through the outer peripheral side of the light introduction portion so that the indicator can emit light;

an index light source formed by a pipe-shaped light-emitting body disposed in such a position that a light-emitting region of the index light source faces to the first through-vision section is opposed to the outer peripheral side of the light introduction plate; and

light emitted from the index light source is introduced through the outer peripheral side of the light introduction plate so that the indexes can emit light.

[16] A needle pointer type meter as set forth in claim 1, characterized in that:

the light transmissive body is formed by a

circular-arc-shaped flat plate extending along the movement route of the needle pointer; and

the light source is opposed to the inner or outer peripheral edge of the circular-arc-shaped flat plate.

[17] A needle pointer type meter as set forth in claim 1, characterized in that:

the light transmissive body has a circular-arc-shaped flat plate portion extending along the movement route of the needle pointer, and a pipe-shaped portion extending in a direction different from that of the flat plate portion; and

the light source is opposed to the pipe-shaped portion.

[18] A needle pointer type meter as set forth in claim 16, characterized in that a condensing section for condensing light emitted from the light source is provided on the light transmissive body at the position opposed to the light source.

[19] A needle pointer type meter as set forth in claim 1, characterized in that the light source is supported by a belt-shaped flexible conductor.

[20] A needle pointer type meter as set forth in claim 13, characterized in that the light source and the index plate light source are supported by a common belt-shaped flexible conductor.

[21] A needle pointer type meter as set forth in claim 1, characterized in that the movable body is a gear wheel which is rotated by the drive device.

[22] A needle pointer type meter as set forth in claim 1, characterized in that the movable body is a belt-shaped body which is moved in the longitudinal direction by the drive device.